

REMARKS/ARGUMENTS

In response to the Office Action mailed December 13, 2005, Applicants amend their application and request reconsideration. No claims are added or cancelled so that claims 7-9 remain pending.

Claims 8 and 9 were stated to be allowable if amended to remove language alleged to be indefinite. Applicants do not agree that the use of "if" in this instance in those claims makes those claims indefinite. That word is used as meaning "when" and that usage does not describe a conditional element but rather is intended to indicate a particular definition that follows. The cited section of the MPEP deals with a different issue and is not pertinent to the language of claims 8 and 9. Nevertheless, to avoid undue attention to an unimportant issue, "if" no longer appears in claim 8. Further, claim 8 is clarified by clearly distinguishing between the photoluminescence produced by a disordered region of the active layer and photoluminescence produced by regions of the active layer that are not disordered. The reference to a "blue shift", meaning a shift in the photoluminescence wavelength toward shorter wavelengths, i.e., toward the blue region of the visible spectrum, is removed from claim 8 and explained in amended claim 7. In addition, amended claim 8 describes using the threshold of that wavelength shift, at least 20 nm, to indicate a substantial improvement in the power level that can be withstood by the laser device without catastrophic optical damage (COD). Thus, a method step has been added to claim 8. Claim 9 has been similarly clarified by eliminating "if" and adding a few words.

Claim 7, the pending independent claim, has likewise been amended. That claim describes a method of fabricating a semiconductor laser device. After depositing a first cladding layer, forming a quantum well structure active layer, and depositing a first second cladding layer, a mask pattern for impurity implantation is formed on that second cladding layer. The mask permits ion implantation close to a facet of the semiconductor laser device. Then that region of the active layer has impurities introduced in order to disorder a limited region of the active layer near the resonator facet of the semiconductor laser device. Those steps, standing alone, are acknowledged to be conventional.

An important feature of the claimed invention is undertaken after the disordering of a portion of the active layer. In that part of the claimed invention, pump light is applied to the disordered region and to a non-disordered region in order to generate photoluminescent light from each region and the wavelengths of those photoluminescences are measured. Based upon knowledge of the structure of the active layer and its composition, the wavelength of photoluminescence light produced by the active layer, where not disordered, can be previously or separately determined. These two wavelengths are used in an important step of the invention to predict whether the semiconductor laser device under construction has an enhanced level of resistance to COD, i.e., can withstand higher power levels without damage than might otherwise be expected in the semiconductor laser device. This step of the invention, particularly in combination with the preceding and following steps of the claimed process, makes the claimed process novel and patentable.

After making the wavelength measurements for predicting the COD power level that the semiconductor laser device, when completed, can withstand, the device may be completed in accordance with the final three paragraphs of claim 7. Of course, if the COD power level that can be withstood is, based on the prediction, unacceptable, then either a further corrective measure is undertaken in the construction of the semiconductor laser device or the semiconductor device, partially completed, is discarded.

Claim 7 was rejected as unpatentable over Nagai (U.S. Patent 5,825,797). This rejection is respectfully traversed both as to examined claim 7 and as to the claim 7 that is presented here.

Fundamentally, the Examiner asserts that Nagai describes all of the steps of the first three paragraphs and the final three paragraphs of claim 7. Applicants agree but those steps alone are not the claimed invention. Rather, the invention claimed includes not only those steps, but, in combination with those steps, applying pump light to the disordered region and a non-disordered region of the active layer, measuring the wavelengths of the photoluminescences produced in response to the pump light, and predicting the COD power level of the semiconductor laser device upon its completion. There is no assertion that these intermediate steps in the process of the claimed invention

are disclosed anywhere in Nagai. In fact, the Examiner acknowledged that failing of Nagai at page 4 of the Office Action.

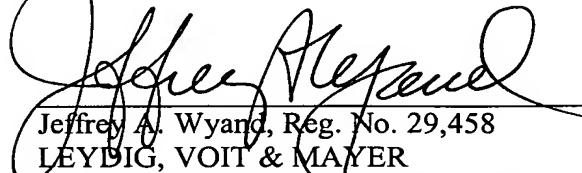
It appears that the Examiner actually intended to reject claim 7 as unpatentable over Nagai in view of Cho et al. (U.S. Patent 5,494,850, hereinafter Cho). Cho was cited, in an offhand manner, as describing “optically pumping the active region” to obtain an photoluminescence spectrum to predict a “peak wavelength”. Applicants acknowledge that Cho describes pumping rare-earth doped calcium fluoride grown in a particular way to produce a photoluminescence spectrum for the material. The purpose of this pumping is to determine whether the calcium fluoride films have improved optical characteristics as a result of annealing.

Cho has nothing to do with the present invention and provides no suggestion for pumping materials of semiconductor lasers for any particular purpose. Rather, the exploitation of photoluminescence in Cho is totally unrelated to semiconductor lasers and their performance. Therefore, it is impossible for Cho to suggest any modification of Nagai to include a photoluminescence generation and measuring step, much less a COD power level predicting step, as asserted in the rejection. Moreover, to the extent Cho may disclose, as asserted by the Examiner, predicting a peak photoluminescence wavelength, prediction of a photoluminescence wavelength has nothing to do with the claimed invention. Rather, in the invention, it is the shift in the peak photoluminescence wavelength that provides valuable information.

Upon reconsideration, the rejection of claim 7 based upon Nagai as modified by Cho, must be withdrawn because there is no relationship between the two patents and no suggestion in either patent for measuring the photoluminescence of a disordered portion of an active region of a semiconductor laser device under construction nor of using information so obtained to determine a COD power level of that semiconductor laser device under construction. It follows that claims 8 and 9 should be allowed as depending from claim 7 and as already indicated as allowable.

Prompt issuance of a Notice of Allowance is earnestly solicited.

Respectfully submitted,



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